Precalculus

Notes 6.3

1. Introduction: Quantities such as force and velocity involve both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. To represent such a quantity use a “directed line segment”.

Ex:

Vectors are denoted by lowercase, boldface letters (i.e. ). Vectors with the same magnitude and direction are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex. 1: Let be represented by the directed line segment from to , and by to Sketch and show **.** Show lengths and slopes are equal: & .

1. Component Form of a Vector

When the initial point and the terminal point are given, the component form of the vector is:

Magnitude of is: Unit vector:

is the zero vector iff .

Ex. 2: Find the component form and magnitude of the vector that has an initial point and terminal point

So,

Magnitude of is:

1. Vector Operations:

A scalar is a real number. Properties of Vector Addition and Scalar Multiplication (Index Card)

Ex. 3: Given and , find

1. 2
2. Unit Vectors

Find a unit vector with the same direction as the given vector by dividing by the given vector’s magnitude.

Given: Magnitude: unit vector in direction of

Ex. 4: Find a unit vector in the direction of and verify its magnitude is

Standard unit vectors: ;